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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/682,427	08/31/2001	Dennis Prediger	45283.7	9464

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EXAMINER	
CREPEAU, JONATHAN	
ART UNIT	**PAPER NUMBER**
1746	

DATE MAILED: 12/24/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/682,427	PREDIGER ET AL.	
	Examin r	Art Unit	
	Jonathan S. Crepeau	1746	

-- The MAILING DATE of this communication appears on the cover she t with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 August 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *30 August 2001* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Drawings

1. The drawings are objected to because Figure 1 shows a direction of current flow that does not match the specification in paragraph 33. The specification states that electrons are released from the anode during normal operation of the fuel cell. However, Figure 1 shows electrons flowing *to* the anode during normal operation. As the description in the specification appears to be the correct version, correction of Figure 1 is required. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Objections

2. Claim 13 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 13 recites that "the galvanic cell is another fuel cell." However, parent claim 12 already defines the galvanic cell as a battery. Thus, claim 13 fails to properly limit claim 12. Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-4, 6-9, 11, and 13-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 7-6778 in view of Wilkinson et al (U.S. Patent 6,096,448).

Regarding claims 1, 7, and 16, JP '778 is directed to a system comprising a solid oxide fuel cell (S2) and a power source (S1) (see abstract). The power source applies a current to the fuel cell such that the applied current flows in the direction opposite to current flow during normal fuel cell operation (see abstract). This has the effect of reversing oxidation of the fuel cell anode (see paragraph 9 of the machine translation). Regarding claims 3, 11, and 13, the power source (S1) is another solid oxide fuel cell (see paragraph 13). Regarding claim 4, the applied voltage is maintained at a predetermined level (see paragraph 22). Regarding claims 6, and 14 the load (11) is disconnected from the fuel cell (S2) via switches (A3, A4) (see Fig. 3). Regarding claims 7, 8, 15, and 16, the system comprises means for applying the power source (i.e., disconnect box 13 and switches B1-B4). Regarding claim 9, the switches and disconnect box are controlled by a controller (see paragraph 12).

While the reference teaches that the external voltage may be applied "by artificial control at periodical or arbitrary stages" in paragraph 12, the reference does not expressly teach that the voltage is applied in response to the measured voltage output of the cell dropping below a predetermined level, as recited in claims 1, 7, and 16.

The patent of Wilkinson et al is directed to a method of fuel starving a solid polymer fuel cell to remove anode poisons. The frequency of the fuel starvation may be controlled in

response to a monitored parameter, such as cell voltage (see col. 4, lines 44-49; col. 7, lines 50-57).

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the disclosures of JP '778 and Wilkinson et al. would motivate the artisan to control the fuel cell of JP '778 in response to its measured output voltage. In paragraph 25, JP '778 teaches that "moreover, this energization processing also did so the effect of recovering the electromotive force of the cell which declined by prolonged operation." Thus, the purpose of the invention of JP '778 is to rejuvenate the anode so that the output voltage of the fuel cell is increased. Therefore, it would be obvious to apply the power source of JP '778 in response to a measured output voltage being below a set value (corresponding to a condition in which the anode is undesirably oxidized). The disclosure of Wilkinson et al. further indicates that such a measurement is a suitable way in which to control a fuel cell system wherein the goal is rejuvenation of the anode. Accordingly, the control of the fuel cell of JP '778 in response to a measured voltage would be obvious to the skilled artisan.

Regarding claims 2, 7, and 16, the artisan would find it obvious to use a voltmeter the measure the output voltage of the fuel cell. Such devices are well known for the purpose of measuring voltage and are widely available and inexpensive.

5. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP '778 in view of Wilkinson as applied to claim 1-4, 6-9, 11, and 13-16 above, and further in view of Dudfield et al (U.S. Patent 5,601,936).

JP '778 teaches that the power source (S1) is another solid oxide fuel cell, but does not expressly teach that it may be a battery, as recited in claim 12.

The patent of Dudfield et al. is directed to a method of operating a fuel cell in which a DC potential is applied to the fuel cell by a battery (20) (see col. 3, line 21).

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the disclosure of Dudfield et al. indicates that batteries are functionally equivalent to fuel cells when used as a power source to apply a voltage to a fuel cell. An express suggestion to substitute one equivalent component or process for another is not necessary to render such substitution obvious. *In re Fout*, 675 F.2d 297, 213 USPQ 532 (CCPA 1982); MPEP §2144.06. Accordingly, use of a battery to apply an external voltage to the fuel cell of JP '778 would be obvious to the skilled artisan.

6. Claims 5, 10, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP '778 in view of Wilkinson as applied to claim 1-4, 6-9, 11, and 13-16 above, and further in view of Mukerjee et al (U.S. Patent 6,620,535).

JP '778 does not expressly teach that the application of the external voltage is also controlled in response to a fuel pressure measurement, as recited in claims 5, 10, and 17.

The Mukerjee et al. patent is directed to strategies for preventing anode oxidation in solid oxide fuel cells. One such strategy is keeping a supply of reformate flowing to the anode so as to keep the anode in a reducing atmosphere (see col. 5, line 9, et seq.).

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated to control the power source of JP '778 based on the pressure of the fuel line. As disclosed by Mukerjee, when fuel is not present at the anode, rapid oxidation may occur. Thus, a fuel pressure sensor may be advantageously used to judge whether enough fuel is present at the anode of JP '778 to prevent anode oxidation. If there is not enough fuel present, then the method of JP '778 may be used to reverse the anode oxidation. Accordingly, the use of a pressure sensor in the system of JP '778 to measure the amount of fuel present at the anode would be obvious to a skilled artisan.

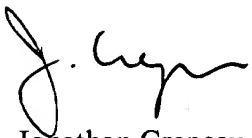
Conclusion

7. The references made of record and not relied upon is considered pertinent to applicant's disclosure: Adams (U.S. Patent 6,339,313), which is directed to a method of rejuvenating a fuel cell which includes the step of measuring its output voltage (col. 4, line 63 et seq.).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Crepeau whose telephone number is (571) 272-1299. The examiner can normally be reached Monday-Friday from 9:30 AM - 6:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski, can be reached at (571) 272-1302. The phone number for the organization where this application or proceeding is assigned is (703) 305-5900. Additionally, documents may be faxed to (703) 872-9310 (for non-final communications) or (703) 872-9311 (for after-final communications).

Any inquiry of general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.



Jonathan Crepeau
Patent Examiner
Art Unit 1746
December 15, 2003